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AUG 25 1935

Tool Engineer

Vol. IV. No. 4.

AUGUST

1935

August will
be busy
month for
Tool
Engineers.

See page 5



See Page 26

Official Publication of the

AMERICAN SOCIETY OF TOOL ENGINEERS

A SMALL DOUBLE END *Bore-Matic*

THE new Heald Style No. 49A Bore-Matic is a small, double end Precision Boring Machine designed and built for the boring of individual parts from opposite ends or boring a number of different pieces that can be handled at a single setting.

Incorporated in this machine are the features of all Heald Bore-Matics, and practically any operating cycle can be obtained, from simply boring at one end and loading at the other, to boring in both directions and facing at one end while loading at the other.

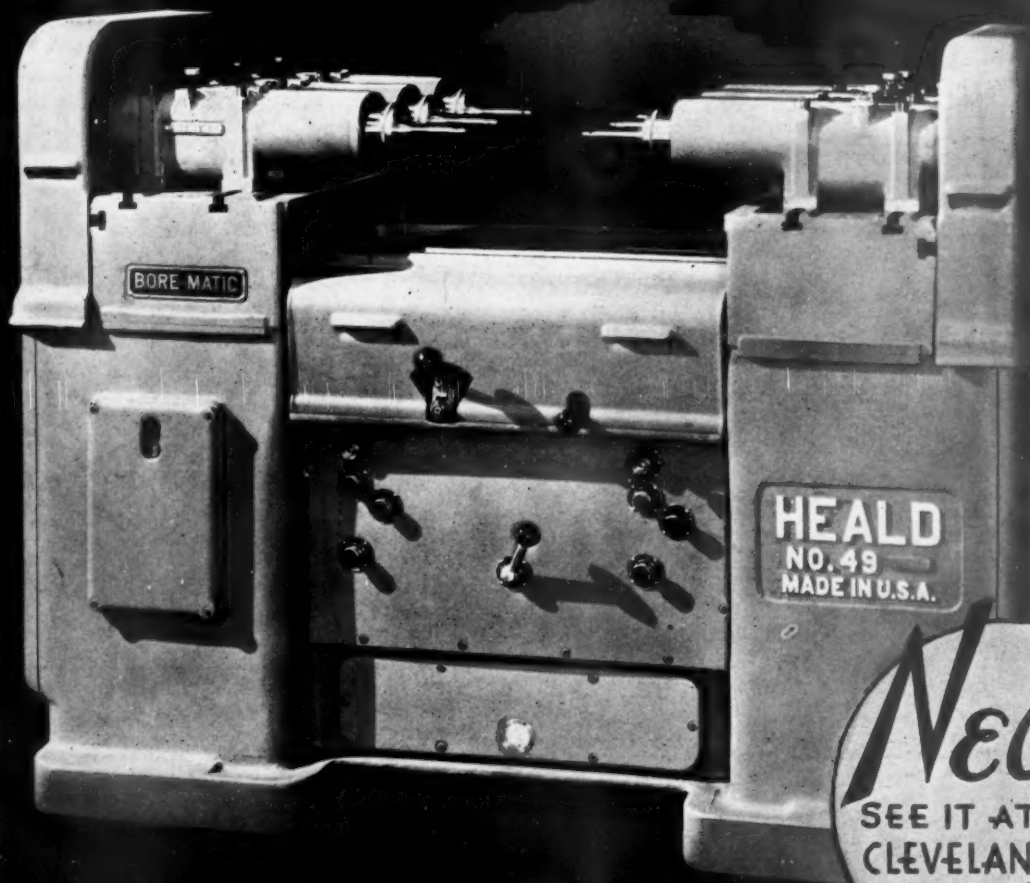
The machine is extremely massive for

its size and has a capacity on each end of three or four boring heads, depending on the size. Its carefully constructed units, together with a liberal use of vibration dampeners, eliminates the transmission of all vibration to the work or boring spindles.

The speed of the spindles can be easily changed to exactly suit the work to be bored.

The Style No. 49A is an ideal machine for manufacturers where production, accuracy, and finish are important requirements. See it at the Show or send for literature.

THE HEALD MACHINE COMPANY, Worcester, Mass., U. S. A.



New...
SEE IT AT THE
CLEVELAND SHOW
SEPT. 11th to 21st

ONE LEVER..

Controls all Functions



... THE NORTON TYPE C SEMI-AUTOMATIC GRINDER

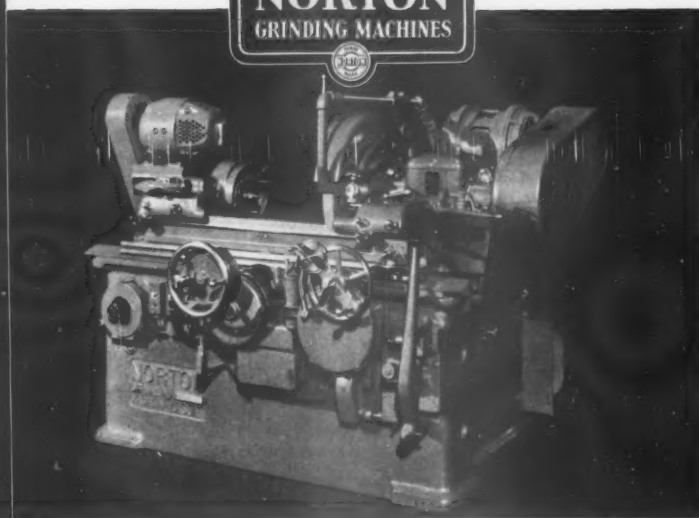
OBSOLESCENCE—you can't see it; you can't feel it; nor will a piece of it ever pop up (literally) and hit you on the nose. Yet, on it goes every second of every day—year in and year out. Like death and taxes you can't escape it. But you can avoid its consequences by a judicious replacement of your older equipment.

Norton Semi-automatics—both 6" and 10"—are the 1935 answer to that never obsolete question—

"What is the best plunge-cut grinder I can buy for my job?"

They are hydraulically operated with one, two or more grinding feeds. They have flood lubricated spindle bearings and forced-feed lubricated ways. Their wheel drive motors are mounted directly on the wheel units and drive the spindles by vee belts without idlers or intermediate shafts. These Semi-automatics were created to do your job better—more economically. And any piece of equipment capable of doing either has a claim to your serious consideration. Unless your machinery is capable of equaling this performance it must be obsolete.

NORTON
GRINDING MACHINES



NORTON COMPANY, Worcester, Mass.—Grinding and Lapping Machines — Grinding Wheels; Abrasives; Pulpstones; India Oilstones — Laboratory Ware; Refractories; Porous Plates — Non-slip Tiles, Treads and Aggregates

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THE TOOL ENGINEER FOR AUGUST, 1935



ENGINEERED PRODUCTION

EXAMPLES FROM THE SUNDSTRAND FILES

No. 3520

Lathes
Milling Machines
Tool Grinders
Centering Machines
Balancing Tools

Milling Flywheel Housings On Hydraulic Rigidmil

Mounted on work carriers, cylinder blocks with flywheel housings assembled as shown in Fig. 1 move up a conveyor line. All machining is complete except finish milling the end pad on the flywheel housing. This operation is required to

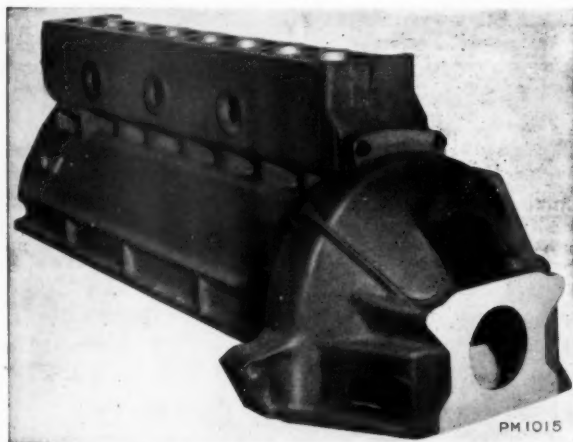


Fig. 1—Cylinder block and flywheel housing on which end pad is Rigidmilled.

insure the pad being perpendicular to the center line of the crankshaft. This is done on the Sundstrand Traveling Head Hydraulic Rigidmil shown in Fig. 2. Operator slides an assembled unit and its carrier from the shop conveyor di-

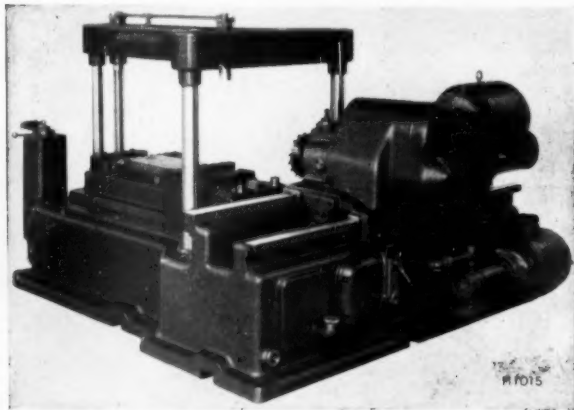


Fig. 2—Rigidmil, showing Traveling Head, Hydraulic Drive, and Fixture.

rectly onto a series of rolls in the Rigidmil fixture continuing the movement until two spring-loaded latches snap up behind the carrier. Now he draws the assembly back against the latches, for approximate location, and operates a lever which controls the hydraulic locating and clamping system. This causes the work-piece to descend onto hardened supporting blocks, spring-loaded jacks under the flywheel housing, and locating pins which register with reamed holes in the cylinder block. Hydraulic clamps automatically grip cylinder block, and lock in position the jacks under flywheel housing. Operator now moves a second lever which causes the Rigidmil head to feed to left, mill the pad, rapid traverse to extreme left, and stop—all automatically. Control levers are now operated in reverse order to unclamp the work and rapid traverse milling head to starting position.

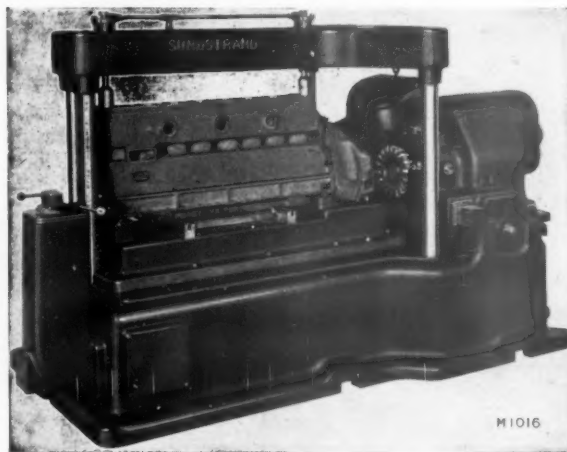


Fig. 3—Rigidmil, showing control station, and work in position.

This Rigidmil fits right into our customer's production line; does its work accurately, rapidly, easily, and dependably. It is an excellent example of the way in which Sundstrand Engineered Production develops equipment to meet production requirements at minimum cost. Investigate! Before you buy new milling or turning equipment let us prepare a Sundstrand Engineered Production Proposal for you.

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The Tool Engineer

Official Publication of the AMERICAN SOCIETY OF TOOL ENGINEERS

Vol. IV.

AUGUST, 1935

No. 4

AMERICAN SOCIETY OF TOOL ENGINEERS

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Application blanks and information pertaining to membership in the American Society of Tool Engineers may be had by addressing *The Tool Engineer*, 2842 W. Grand Boulevard, Detroit, Michigan, or the Secretary's office, 31 Melbourne Ave. Detroit, Michigan. Dues are \$5 initiation fee, \$3 per year for senior grade membership and \$2 per year for junior grade membership.

The Tool Engineer is published on the first Thursday of each month. It is the official publication of the American Society of Tool Engineers, Incorporated. The membership of the Society and readers of this publication are practical manufacturing executives such as master mechanics, works managers, tool engineers, tool designers and others who are responsible for production in hundreds of plants throughout the nation and in foreign countries.

Owing to the nature of the American Society of Tool Engineers organization, it cannot, nor can the publishers be responsible for statements appearing in this publication either as papers presented at its meetings or the discussion of such papers printed herein.

Published by
THE BRAMSON PUBLISHING CO.
2842 W. Grand Boulevard Detroit, Michigan
Roy T. Bramson, Publisher and Editor

Advertising Offices
Cleveland, Ohio Chicago, Illinois
216 Union Bldg. Box 286
Cherry 5473 Oak Park, Illinois
Providence, R. I.
4 Weybosset Street

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Everybody's Going!

It's not too early to make your reservations **right now** to go with the Detroit and Michigan groups of the

American Society of Tool Engineers
to the



If you haven't sent in your reservations—turn, now, to pages 12 and 13 of this issue of *The Tool Engineer*, where you'll find complete details. Act now!

PRODUCTION PERSPECTIVES

• • • • •

All the Tool Engineers that we know are so busy—and will be for the next few weeks, at least—that they are wondering if they can get all the work out that has been assigned to them. We're speaking of production executives—many of whom are in the midst of "programs." **Much new equipment is being bought** particularly in the Detroit area, where the **tendency of automotive manufacturers is toward combining operations in a very definite effort to further reduce costs.** Try to get hold of a machine tool representative these days—they're all too busy to talk to you, unless you are in the market for tools. Or, better yet, try and find a tool designer to work for you. The fact is there aren't any available—they're all working. It all looks rather encouraging we'd say. And—with all this it's so darn hot—a lot of us would like to shift some of this up a couple of months to some cooler weather. Oh, well—remember August a year ago—we had *some* time to take it a little easier in the sweltering month.

And with all this rush we have a big job ahead—going to Cleveland. As you know some 1200 A.S.T.E.ers and their Tool Engineer friends in the industry are going by boat, *enmasse*, to Cleveland for the Machine Tool Show—**September 12th.** There's lots of work to be done by A.S.T.E. committeemen. You can make their job easier by sending in your reservations as soon as possible—don't wait for someone to come around and *sell* you on this. You don't need to be sold. You can surely spare the \$10 and the one day away from your job to go. At the pace most tool engineers are going—they need the "relaxation" that this **glorious "stag" party** will give them. The entire boat is *chartered* by A.S.T.E. for the trip—your stateroom on the boat is your hotel room for the trip. At the show you'll see what's new in your line, meet old friends from all over the world and have a trip you'll not soon forget. The \$10 base price **includes all essentials** of the trip except the luncheon on Friday in Cleveland. This *is* something to look forward to—make your reservation now.

Frank L. McKenna, A.S.T.E.er, production manager of Detroit Stamping Company, has left for an extended trip throughout the west. He intends to visit all citrous refineries and airplane plants as well as oil well machinery manufacturers. Mr. McKenna is a specialist on metal stampings such as are used in these industries.

E. F. Roberts, for some thirty-two years connected with **Packard Motor Car Company**, has resigned his position as Vice President in charge of Manufacturing. Mr. Roberts, after his many years with the Packard Company will retire. Succeeding him in the same capacity is **George T. Christopher**, who has been associated with the Packard Company for the past year and was largely responsible for getting Packard's new 120 model into production.

Arthur Higginbottom, formerly Purchasing

Agent with Graham-Paige is now connected with the **Commerce Pattern and Foundry Company.** **Carl Davis**, until recently a Tool Engineer with the Chrysler Corporation has joined **Vickers**, Incorporated of Detroit.

Tim Sheehan we hear is back with **Reed-Prentice Corporation**, Worcester Massachusetts as plant superintendent. **Cincinnati** is one busy town, we hear, machine tool builders **swamped with orders**, getting ready for the Show and **working in many plants twenty-four hours per day**, with a marked shortage of trained men. In the near future a **Prevue** showing of the new **I.S.M.A. Injection Moulding Machine** will be held at Cincinnati. The machine, **Sterling-French**—Detroit agents—announce is for the moulding of thermo-plastic materials.

From Cleveland we hear that **Ashton G. Bean**, retired president of the White Motor Company and a nationally known industrial organizer, died at his home in Elyria, July 19 at the age of 63. Mr. Bean had been chief receiver for Studebaker and was highly instrumental in pulling this company out of its financial embarrassment. Also from Cleveland we hear that the **Standard Vacuum Cleaner Mfg. Co.**, is just placing a new low-priced "**Keystone**" vacuum cleaner model on the market to retail at \$39.50. Distribution will be through independent hardware stores exclusively. **Western Automatic Machine Screw Company** of Elyria is expanding. The company recently called for bids on a new one story building, 190x210. No doubt, new equipment will be purchased also. A new electrical device for grinding waste foods in the kitchen is announced by **P. B. Zimmerman**, of the **General Electric Company.** The purpose of this new electrical device, which is fastened to the bottom of the sink, is to allow the disposal of garbage by flushing through the sink drain. The new unit will be manufactured at General Electric's **Fort Wayne**, Indiana plant.

From Worcester, Massachusetts we hear that the **Norton Company** has formed an **Italian Norton Company** to manufacture grinding wheels and abrasive articles. Manufacturing personnel has not yet been announced by the company, but a **few experienced men** will be sent over as supervisors. **Machinery and buildings** of the **S. A. Richards Ginori** plant near Milan will be **modernized** for use by the new Norton Company so that all varieties of Norton wheels can be produced.

From Saginaw we hear that Mr. Phelps, formerly of the Delco Division of General Motors at Dayton is now manager of the Steering Gear Division of the Corporation in Saginaw. Mr. Beach who has been a buyer of equipment at Packard Motor Car Company in Detroit is now in charge of Standards for the company and Mr. Crain has taken over Mr. Beach's former duties.

Judging Resistance Welders

by R. L. BRIGGS

Research Engineer*

AT THE PRESENT time resistance welding machines have thoroughly established themselves in industry as production tools. They offer the fastest method of fabrication or assembly of ferrous and non-ferrous products which has yet been developed. While the first cost is often high, a resistance welder in competent hands is capable of turning out an astonishing amount of welding, and the welds are of uniformly excellent quality. Despite this fact, much misinformation and many misconceptions regarding resistance welders exist.

Why should this condition occur?

The answer to this question is three-fold. First, information supplied by the welder manufacturer is often unduly influenced by the sales viewpoint. This results in a presentation of the favorable and a suppression of the unfavorable side of the picture. Second, technical articles rarely present all sides of the matter they profess to discuss. Third, the point of view of the purchaser of welding equipment is too frequently overlooked in the presentation of data on resistance welders.

Let us consider the purchaser's viewpoint. He is primarily interested in two factors—the EXPENSE and the USEFULNESS of the tool he is buying. He is seeking to determine which resistance welder will give him the most "usefulness" for his money. This is a fair attitude and a just basis for comparison provided, of course, that the purchaser has the correct understanding of what constitutes "expense" and what factors produce "usefulness."

There are three basic costs which should be included in the "expense" item. These are:

- a) initial cost;
- b) upkeep cost; and
- c) operating costs.

As is true with most equipment which is subject to wear, the initial cost and the upkeep cost are related to some extent. Quality materials, careful manufacture, and sound design are elements which lead to relatively high initial costs, but also result in low upkeep costs. Second rate materials, careless construction, and inferior design may make low initial costs possible, but invariably mean high upkeep costs. Operating costs, on the other hand, of equipment manufactured for a given type and class of work will vary and this variation is due to a surprising extent on the technical excellence of the design—particularly the design of the electrical circuits.

There are three basic features or characteristics which can be used to measure the "usefulness" of a resistance welder. These are:

- a) utility;
- b) flexibility of control;
- c) welding ability.

By utility is meant the opportunity which the welder offers for welding relatively wide

ranges of work of similar nature. Obviously certain welders must of necessity be built for a specific job, and such welders should not be judged on the basis of utility. Certain classes of welders such as spot welders should, however, contain those features which make the welder adaptable to various methods of assembly of parts to be spot welded, and applicable to various sizes of units to be assembled. A spot welder limited to one style or method of assembly is about as useful as a drill press which bores only one size of hole.

By flexibility of control is meant the opportunity of adjusting through a reasonable range of adjustment those three essential elements in resistance welding:

- 1) welding pressure;
- 2) welding current magnitude;
- 3) the duration of application of the current, the pressure or both.

It is only by means of the proper adjustment of these three factors that the best results can be expected. Welders which offer only two of the three essential adjustments place a handicap upon the operator which often is difficult to overcome.

Of the three factors influencing "usefulness," however, WELDING ABILITY is by far the most important. It is this ability to weld which makes the machines WELDERS and not useless pieces of equipment. Those features of design which effect welding ability also affect operating cost, and since the two characteristics are thus linked together they will be discussed together.

In order that a proper understanding of welding ability may be clearly fixed in the minds of users or prospective purchasers of resistance welders let us make an analogy between a welder and a reciprocating steam engine plant. This plant consists of a steam boiler, pipes leading to the engine, and the engine itself. Now there is a certain amount of energy in the fuel used to fire the boiler. Much of this energy is lost up the smokestack and in heat radiated from the boiler. There is also a loss in the energy of the steam as it passes through the pipes to the engine. The steam drives the engine, and develops a certain amount of useful power. However, there is still energy in the steam discarded by the engine, and this is fed back into the boiler again. Now we might call the relationship between the useful power developed by the engine and the total power actually in the steam passing through the engine, the POWER FACTOR. We might also call the total available useful energy the input energy, and measure the EFFICIENCY of the system by the percentage of this useful energy which is developed by the engine.

While the analogy given above is not an exact one, it will present a picture of what occurs in the resistance welder. The apparent power which is fed to the welder is measured



*Thompson-Gibb Electric Welding Company, Lynn, Mass.



by the product of the line voltage and line current supplied to the welder. Actually, the welder does not use all of this apparent power, and some of it is returned to the electric supply system. That percentage which it does use, however, expressed as a decimal fraction of unity, is known as the **POWER FACTOR**. If the power factor is 0.50, for example, the true power INPUT to the welder is one half of the apparent power delivered to the welder. Since the electrical operating costs are usually based on the apparent power supplied to the equipment it is evident that the power factor of the equipment is an important characteristic.

Only half the story has been told, however. The welding ability of the welder is determined by the useful power OUTPUT developed at the welding points. That percentage of the input power which appears at the output of the welder, expressed as a decimal fraction of unity, is known as the **EFFICIENCY** of the welder. If the efficiency is 0.50, for example, the power output (i.e.: the real measure of welding ability) is only one half of the useful power input. It hence follows that from an electrical operating cost (or apparent power input) point of view the real measure of welding ability is not the power factor or efficiency alone, but **THE PRODUCT OF THESE TWO FACTORS**. This fact is easily demonstrated, and is well known by all electrical engineers.

From a practical point of view what lesson can be drawn from this? Let us take an example to illustrate. Suppose we have two welders designed for the same type and size of work. Both are drawing an apparent power of 100 KVA from the electrical supply system. The first welder has a power factor of 0.60 and an efficiency of 0.40. The second welder has a power factor of 0.05 and an efficiency of 0.50. Now the E.P.F. factor (the efficiency times the power factor) of the first welder is 0.24. The E.P.F. factor of the second welder is 0.25. What conclusions can be drawn from this? For the same cost of electric energy the second welder delivers 25 KW of output useful power to the other welder's 24 KW. The second welder, hence, will:

- 1) weld larger stock for the same cost;
- 2) weld the same stock at less cost;
- 3) will retain this advantage for all ranges of stock sizes.

Note particularly that in this illustration (a perfectly practical one) the better welder from the standpoint of welding ability is the one operating at the lower power factor.

From what has been previously said it would seem that the designer of resistance welders would make every effort to produce machines having as high an efficiency and power factor (i.e.—as high an E.P.F. factor) as possible. As a matter of fact he does. Unfortunately, however, those design features which tend to give high power factors are the features which produce low efficiencies, and vice versa. It is not my purpose to discuss these design features and their effect on efficiency and power factors since this has been done in other technical papers. It is important, however, that the purchaser of resistance welders should have confidence in the

abilities of the designers of those welders in which he is interested, and not let any claims of high power factor alone, or high efficiency alone, blind him to the fact that it is the product of these two factors which measures the excellence of the design of the electrical circuits in the welder. He should bear in mind that the manufacture of a welder having a good E.P.F. factor is a problem calling for experience and expense. He should expect to find a reasonably economical performance commensurate with the initial cost of the welder, and he should not forget that performance is judged by welding ability.

It should be obvious that different styles of welders will have different E.P.F. factors. As a matter of fact, no matter how careful the design, the farther away from the welder transformer the welding occurs, the lower is the E.P.F. factor. Also as the leads from the welder transformer are spread farther apart the E.P.F. factor goes down. Hence it follows that comparisons between welders should be made only when the welders are required to do the same job. If the purchaser of welders will keep the ideas presented in these paragraphs in mind he will not go much astray in making a wise choice.

"STAG DAY" AT GOWANIE COUNTRY CLUB ATTRACTS MANY A. S. T. Eers

Anyone passing the Gowanie Country Club, Saturday, July 20th, might easily have thought that the Detroit A.S.T.E. was enjoying a field day at the course.

Actually Harold Trombly of the Chrysler Corporation, and President of the Club, had extended invitations to a large contingent of A.S.T.E. members and friends. Among those present—especially at the "Spa" in the woods near the fourth tee—were Bill Smila, Jack Loef and Howard Brant of the Chrysler Jefferson Plant, Fred Flack and "Doc" Gronow of the Dodge Plant, R. M. Lippard, A.S.T.E. President, Ford Lamb, A.S.T.E. Vice President, A. M. Sargent, A.S.T.E. Secretary, Ed Harper of the National Automatic Tool Company, L. C. Gorham of the Gorham Tool Company, Bill Tann of Congress Tool & Die, Otto Proefke, Enterprise Tool Company, Mr. Lamb of Cogsdill, Mr. Raske of Enterprise Machine Parts, Mr. Rawson of the Motor City Tool Company, and Frank Gertiser of Cincinnati Milling Machine Company.

Score cards did not indicate that the golf played by any of these Tool Engineers had the characteristic *precision* of their profession. However, all agreed that they had had a most enjoyable day and were heartily in favor of returning for another day of festivities at Gowanie. Frank Gertiser won a prize for the longest drive—245 yards.

Assisting Mr. Trombly were Willard Jackson of Motor City Tool and Clyde Hause of Gorham Tool—both well known in the industry. Several A.S.T.Eers learned of the playing membership which may be had at Gowanie at the nominal cost of but \$25 for the remainder of the season—and joined. Any other A.S.T.E. members who may be interested should get in touch with Mr. Trombly.

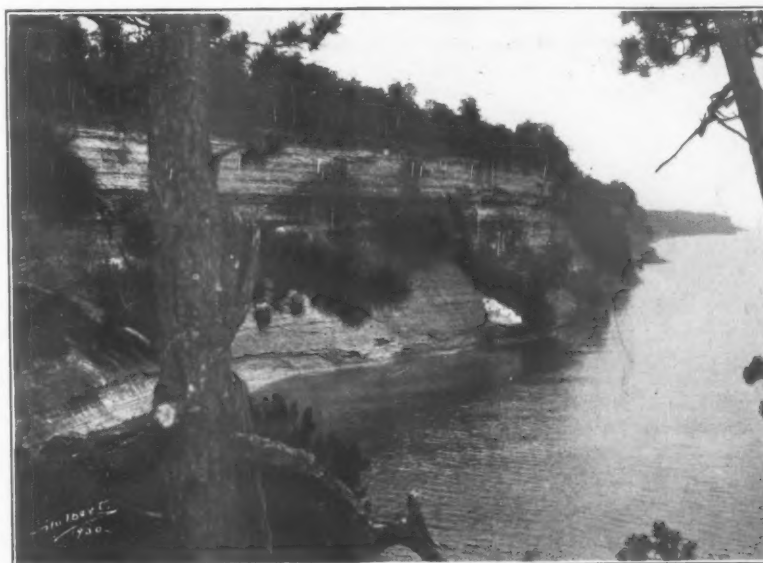
The Tool Engineer's Vacation Tips



Interlochen State Park

For the Tool Engineer's vacation we suggest Michigan, Land of Hiawatha, with its many inland lakes, excellent fishing, boating, swimming and beautiful deep forests. Easily accessible from the east through Canada via Detroit or Port Huron and from the south and middle west via Detroit or Chicago over thousands of miles of splendid roads, Michigan offers a great variety of vacation treats to suit the whims of the most fastidious. Anyone

interested in vacationing in Michigan may obtain full details in beautifully illustrated literature from any one or all of the Michigan State Tourist and Resort Associations as follows: East Michigan Tourist Association, Bay City, Michigan. Upper Michigan Development Bureau, Marquette, Michigan. West Michigan Tourist and Resort Association, Grand Rapids, Michigan. Southeastern Michigan Tourist and Publicity Association, Detroit, Michigan.



Pictured Rocks—near Munising, Michigan

Illustrations, courtesy Michigan State Department of Conservation.

First A. S. T. E. Golf Tournament Highly Enjoyed

The first Detroit A.S.T.E. golf Tournament held at Redford Country Club July 13th, was a success from the standpoint of enjoyment to those who participated. The weather was ideal and the first foursome got underway about 9:00 a.m.

Starting times were strung about all through the day up until about the time the "Gangsome" went out for a few extra holes at twilight after partaking of considerable lunch and refreshments. This Gangsome consisted of about nine participants, a bunch of caddies, and a flock of spectators. A sizzling blast of twenty-five feet won the driving contest off the first tee in the Gangsome.

Winners in the Kicker's Handicap were:

- 1st—C. L. Hause,
- 2nd—E. R. DeLuiz,
- 3rd—J. T. Fitzgerald,
- 4th—W. H. Smila.

Bert Carpenter was low gross with an 80. Larry Howe, second with a fine 83.

Louis Machall proved the most honest man by admitting a 145 and Fred Gollbach with a net of 62 received a special award for being the best exponent of Ananias. However, Fred insisted that the Handicap of 40 which appeared on the sheet after his entry, was cooked up by some of his "friends." "Casey" Jones won a special award for taking the lowest number of strokes on the longest hole, four on the ninth hole, and Harry Hood took the honors for the most strokes on the shortest hole with a dazzling fourteen on the 137 yard 8th.

Among the interesting episodes was one that cost Frank Gertiser two bits. He made a side bet that no one in his foursome would put his drive in the brook at the eighteenth hole. All four found the water with their tee shots. What a bunch of pals! Bill Smila, as usual, proved himself to be bigger and better than this whole foursome as he tied their record single handed by putting four new balls in the same creek in four successive shots.

The course was in excellent condition and the points were well handled by Jack Winne, the Redford Manager, and Bill Fishlock, the Pro.

Plans are underway for a Fall Tournament after the Cleveland Trip and it is hoped that the prize fund will be considerably larger and the attendance increased.

Have You a Copy of the February, 1935 *The Tool Engineer*?

The Secretary's office is badly in need of a copy of the February, 1935 issue of *The Tool Engineer*.

Any member or reader of this publication who has a copy of this issue to spare will confer a great favor by getting in touch with the secretary's office, 31 Melbourne, Detroit, Michigan.

Copies of January and May, 1933 and May, June, July and August, 1934 are also wanted.

Machine Tool Show Will Be Biggest Ever Held

Cleveland, Ohio—Despite the fact that business has been poor for 4 or 5 years, the Machine Tool Builders Show at Cleveland, Sept. 11-21, will be the largest ever held.

Over 5 acres of display space will be utilized including the complete facilities of the big Public Auditorium and the Underground Exhibition Hall. Over 90 per cent of the space had been contracted up to June 20.

Approximately 900 machines are expected to be in operation in addition to the stationary displays of tools and accessories, according to Herman H. Lind, general manager of the Machine Tool Builders Association.

An optimistic note was sounded by Mr. Lind as he pointed to the curtailment in purchases of durable goods during the depression period and the natural inclination to get along with present facilities during times of slow business. "It has been established," he said, "that 75 per cent of the machine tools used in America today are more than 10 years old. The advance in machine tools in the meantime has been such that it is evident there is a large demand ahead. Replacement is small to date and we anticipate a more general wave ahead. Necessity for better products and low cost production insures the market for machine tools in the future."

Some Highlights of the Show

- 238 EXHIBITORS—occupying 238 booths—areas from 200 to 4000 square feet to the booth—exhibiting machine tools; other machinery; accessories; related machine shop products.
- 120 Machine Tool builders—members of the National Machine Tool Builders' Association will set up in the new underground Exhibition Hall a \$3,000,000 machine shop, containing over 900 machines—600 types all in full operation—Machines to make the tiniest part for a lady's watch; and besides the machines that fashion parts for mighty battleships. Machines that make machines—well named the "Master Tools of Industry."
- In two other Public Auditorium halls, 118 more companies will exhibit machinery other than machine tools, accessories, and related products—350 different items—ranging from ball bearings weighing a fraction of an ounce to 20 ton presses.
- 235,000 SQ. FT.—5 $\frac{3}{10}$ ACRES of exhibit area—the entire available space in Exposition Hall and Public Auditorium.
- 2,500 TONS (5,000,000 lbs) of Machinery.
- MACHINE TOOL GRAY the standard finish on all machines.
- 400 Freight Cars hurrying to Cleveland from 16 states and 76 cities to be in time for installation date—September 2nd.
- 5,000 KW of Electrical Current to pull the hourly load when machines are under power.

More Than 400 Attend A.S.T.E. Outing

A perfect day and an excellent environment provided the background for A.S.T.E.'s most successful annual outing. The environment was the beautiful Maple Grove Park on Utica Road some fifteen miles out from Detroit. The Outing was the third annual A.S.T.E. affair of this kind in which all A.S.T.E.ers and their families and friends were invited. Between four and five hundred attended and, judging from the high spirits of everyone, a thoroughly enjoyable time was had by all. Sunday, June 30th the day of the much looked forward to event, was a bright sunny day—not too hot—which also contributed to the fun for everyone.

Two ball games started the organized activities of the men. The first game, a highly contested battle between Senior and Junior members of A.S.T.E. was won by the Seniors—who reversed the procedure of a year ago and took a "sweet" revenge over their more youthful colleagues. Upon the conclusion of this game a group of Senior seniors (old timers) challenged the winning seniors and after five stiff innings decided the game was a tie.

For the children there were many athletic events with prizes. A fine dance pavilion provided an excellent floor with a good orchestra for those who wished to dance. A highlight of the day was the 100 yard race—won by our Secretary A. M. Sargent. This "dash" was hotly contested by Mr. Sargent who put up quite a battle against the "field"—which was none other than our very good jovial friend Mr. Dave Forsman. Our hats are off to you Dave—you sure gave Al a good "run."

In addition to the 100 yard "dash" there was also a fat men's race. To qualify for this race a contestant had to have a waistline measurement greater than his chestline measurement. The result of these requirements put nearly all contestants in the 200 pound class and the field was not restricted. Quite a few qualified. The winner was Mr. Joe Siegel, whom we hadn't suspected, heretofore, of being a "fat" man.

The days activities wound up about dark, when mothers and children proceeded to gather up lunch baskets, thermos bottles, etc., and got into their cars. It did not take long to get started for home—a tired but happy crowd.

OUR SEPTEMBER ISSUE

will be an extraordinary number featuring much news of The Society and the Machine Tool Show. Be sure to save this important issue, which will be mailed to you about August 20th.

NEW TAP CHART

A.S.T.E. members and readers of *The Tool Engineer* will be interested in a new tap chart—a Per

LETTER FROM A READER

Mr. A. M. Sargent, Secretary
American Society of Tool Engineers,
31 Melbourne Avenue
Detroit, Michigan

Dear Sir:

I have just had the pleasure of reading the May issue of the "Tool Engineer." I do not know through whose courtesy the publication was sent, but I wish to add that it was very interesting.

I have been a member of other organizations for, over 12 years, and during this time several attempts have been made to give production engineering a place in these societies. It seems that efforts in this direction have been futile. After reading the editorial on page No. 12 of your May issue by Mr. O. B. Jones, I am of the opinion that production engineering is after all, going to gain the recognition it so justly deserves.

Production men and tool engineers in this vicinity frequently comment on the necessity of having some activities which would promote the very things which you are doing with tool engineering. It is very gratifying to know that the tool engineers of Detroit have, no doubt, had the same feeling for a long time, and have met their problem with the formation of the Society of Tool Engineering. I can assure you the "Tool Engineer" publication was mighty interesting, and extending my sincere good wishes for its future success, I am

Yours very truly,
Eugene Bouton.

EB:SO

(Care of I. Case Company, Racine, Wisconsin)

Cent of Thread Chart—compiled by the R. G. Haskins Co., Chicago, Illinois. It is unique for the completeness of the data presented. Free on request to users of tapping equipment.

CORRECTION

On page 24, second paragraph, May issue of *The Tool Engineer*, it was stated that the molybdenum tungsten high speed steel contains 80% molybdenum and 20% tungsten. This should have read **8% molybdenum and 2% tungsten**. Mr. d'Arcambal in his talk before the April meeting of A.S.T.E gave the correct figures, but a typographical error caused the above mistake to be made.

One of the boys tells this one on himself. His little girl, during dinner, asked: "Going to work tomorrow, Daddy?"

"Huh? Oh, sure."

"Same place?"

"You know," commented a pencil wrestler. "I like it first rate over at the Packilac. Only, I wish they'd move the boards into the rest room, so we could smoke while working."

AN IDEA AND AN IDEAL

AN EDITORIAL

By O. B. JONES

"Reading maketh a full man, writing an exact man, and speaking a ready man." The one who coined that doubtless had in mind that being full of knowledge exactly classified and ready for instant use is a condition to be coveted. Our colleges are filled to overflowing each year with youngsters whose elders have backed their faith in its virtue to the tune real money makes. And the ones who have the money are the best judges of a profitable investment. We can store our minds with knowledge faster and at less cost by reading than by any other known method. Only a fool profits only by his own expense. Wise men read. That's the accepted way of becoming the "full man."

It's relatively easy to be filled with knowledge today. But the percentage of men who become exact is very small. It takes too much painstaking labor and courage to classify one's knowledge and put it down in writing to be picked to pieces by the multitude. One of the most difficult mental feats for any person is to assemble the fragments of information he has in his mind and set them down logically. The best medicine is always the hardest to take. Criticism is the best medicine for anyone who is aiming at perfection. Criticism is the one thing little men fear. Until they can take it they never become big. It is this fear of criticism that makes a writer an exact man. Only a great desire to be able to think clearly can induce a man to write. Every great executive is a good writer and a clear thinker. Many good writers are good executives.

It follows as surely as day follows the night that a good writer is a good talker, for a forceful and convincing talker must assemble his thoughts logically. The step from being a good writer to becoming a good talker is not as difficult to take as the step taken in becoming a good writer after being a good reader. A higher degree of courage is required to become a good speaker than is required

to become a good writer. So the percentage of good speakers is smaller than the percentage of good writers. The higher type of executive is a good speaker whether he is outlining a project to an individual or addressing an army.

Nearly every man has a secret ambition to become a good executive. No man could have a more worthwhile aspiration. Leadership, or executive ability, has always received the most lasting acclaim of the multitude and the richest rewards of business and industry. It's the most scarce and most powerful asset for good the race possesses.

These facts have been read, written and spoken so often, in so many ways, it seems a waste of printer's ink to recount them here. It's only the natural modesty and retiring disposition of the tool engineer that makes it necessary to recall them again.

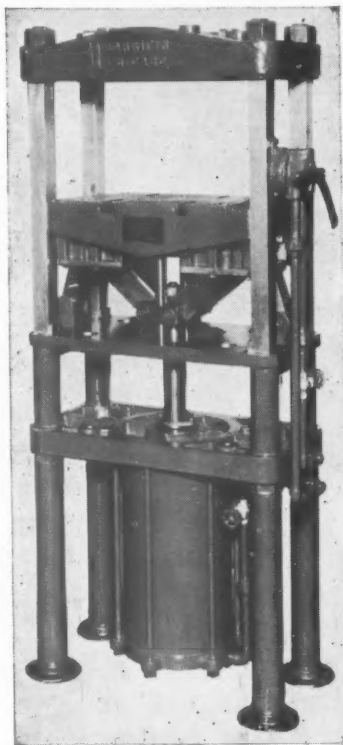
The American Society of Tool Engineers was organized to provide an opportunity for Tool Engineers to become better executives, since every tool engineer must be a good executive. It provides an opportunity, through the medium of its Journal, to read articles pertinent to Tool Engineering. It provides an opportunity through the same medium to become a good writer, and to top off his training, it provides a monthly opportunity to become a good talker.

But, bless his poor timid soul, the average Tool Engineer has to be spanked into perfection. He has to be wheedled into writing an article for the Journal and literally cornered and driven into giving a talk at one of the meetings. It doesn't seem difficult to get new members desiring to profit by the experience of others but it's a rare occasion when a new member is found who desires to pass his knowledge and experience on to the other members of the Society. God give us more workers!

NEW EQUIPMENT

Hannifin Air Operated Moulding Press

A compact 15-18 ton capacity air operated platen press for plastic and rubber moulding operations is announced by Hannifin Manufacturing Company, Chicago. The design of this new press provides an advance stroke at six times the speed of the pressing stroke. The advance stroke is $5\frac{1}{2}$ inches at 6,000 lbs. pressure and the pressing stroke $1\frac{1}{2}$ inches at 30,000 lbs. This cycle of operation permits rapid production, and one operator easily handles the steady production of several presses.

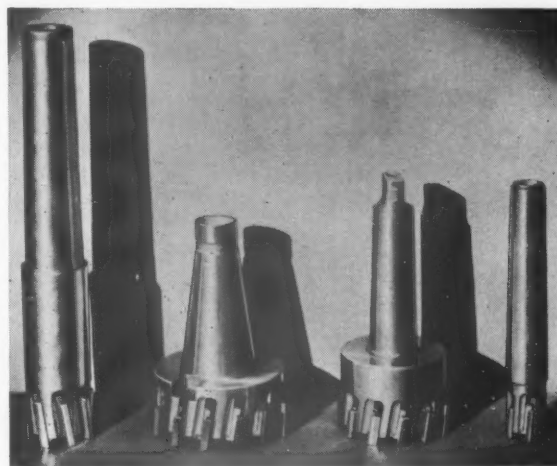


This new press is being used for both hot and cold moulding, rubber moulding, and several types of special moulding operations. One prominent manufacturer of electrical specialties has already installed 34 presses of this type. Speeds and pressures may be regulated to suit individual requirements of any particular moulding work.

An especially valuable feature of this press in plastic moulding work is the provision for the use of maximum pressure to "break" or separate the moulds on the reverse stroke after the pressing operation is completed. An air cushion at the end of the stroke prevents shock. Use of the ordinary shop air supply makes it unnecessary to install hydraulic pumps or special hydraulic power supply. This feature is particularly important in the establishment of a moulding department, or the modernization of present facilities at a moderate investment.

Ingersoll Zee Lock End Mills

The Ingersoll Zee Lock Cutter Blade, which was particularly designed for Ingersoll Face Mills, has now been applied to inserted blade End Mills. The Zee Lock Cutter Blade is positively locked in the cutter body by a zee shaped wedge.



Applied to small End Mills, as shown in the accompanying photo, it makes a simple and effective tool. Using renewable cutter blades of either High Speed Steel, Super-Cobalt High Speed Steel, "J" Metal, or Cemented Carbide, the cutting edge and only the cutting edge is of hard and heat resisting material. The cutter blades are of forged and heat treated chrome molybdenum steel. The whole makes a cutter which compares in cost with the solid cutter in the smaller sizes and is somewhat cheaper in the larger sizes. The replacement cost of a new set of blades is considerably less than for a solid cutter. Furthermore, longer wear is obtainable with inserted blades.

End Milling Cutters as small as $1\frac{1}{2}$ " diameter are made. Cutters are furnished with blades of suitable thickness or spacing for either roughing or finishing operations. They can be provided with shanks to fit the National Standard Milling machines, Ingersoll or Seller tapers, etc. Cutter housings with an extended body are obtainable for special operations.

NEW -- Hydratrol Lathe

The Hydratrol Lathe produced by Lehmann Machine Co. of St. Louis, is so called because it utilizes hydraulic means (80 lbs. pressure) to automatically effect its 16 forward and 8 reverse speed changes for the spindle, the brakes, spindle release and automatic relay.

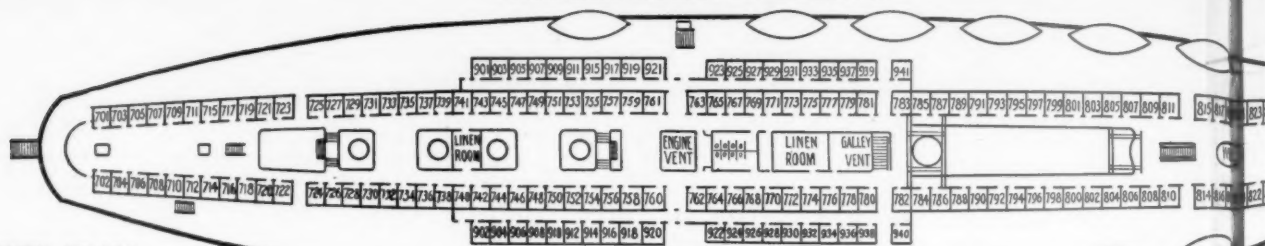
A rotary selector valve operated by a three-lever handle provides the channels for hydraulic operation of friction clutches on the primary shafts, and positive internal and external gear type clutches on the high torque shafts. This valve may be turned to any desired speed without operating the stop and start valve and without dwell at intermediate speeds.

The automatic relay functions when any of the three positive clutches are shifted and whether the

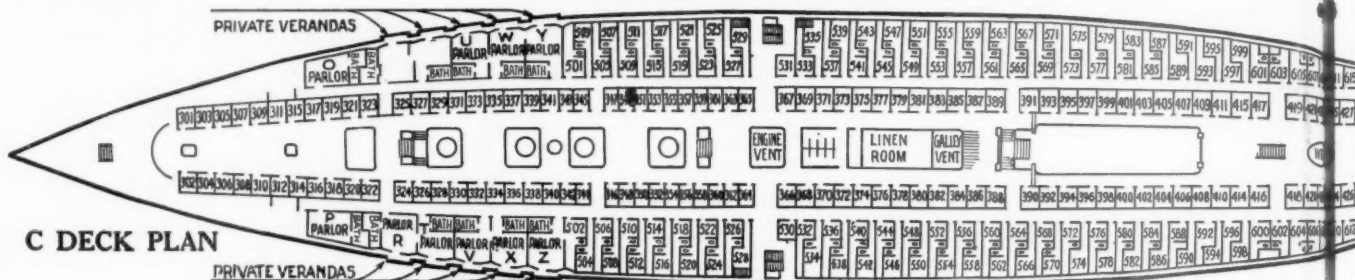
(Continued on page 16)

STEAMER GREATER DETROIT

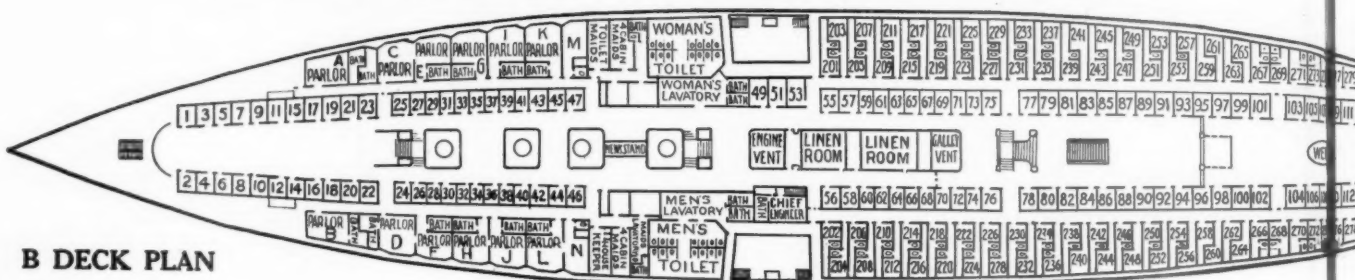
D DECK PLAN



C DECK PLAN



B DECK PLAN



AVAILABLE \$10 ACCOMMODATIONS

Base Price \$10.00 includes transportation on the steamer to and from Cleveland breakfast on board Friday morning, Sept. 13th, entrance and registration to the Machine Tool Show,

Banquet and admittance to A.S.T.E. Technical Session, Hotel Statler, and souvenirs, etc. Also berth accommodations as follows:

56 Single inside rooms (will sleep only one person)†

Room numbers: 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365.

190 Double inside rooms. These will not be sold as singles. (will sleep 2 or 3 persons—double lower and single upper berths)†

Room numbers: 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 42, 43, 46, 47, 55, 56, 57, 58, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100,

101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200.

† These accommodations included in the \$10.00 trip.

DELUXE ACCOMMODATIONS, SLIGHT EXTRA COST

Additional accommodations are available at nominal costs in addition to the \$10.00 base for the trip.

214 Outside Double Rooms, will sleep 2 or 3, double lower and single upper berths \$2.00

Room numbers: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 116, 117, 118, 119, 240, 241, 244, 245, 246, 247, 252, 253, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 274, 275, 276, 277, 278, 279, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 314, 315, 430, 431, 432, 433, 528, 529, 530, 531, 532, 533, 574, 575, 578, 579, 582, 583, 586, 587, 588, 589, 590, 591, 592, 593, 595, 596, 597, 598, 599, 608, 609, 610, 611, 612, 615, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 784, 785, 786, 787, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, and 941.

126 Outside rooms with toilet \$4.00

Room numbers: 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 242, 243, 246, 247, 250, 251, 254, 255, 270, 271, 272, 273, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 534, 535, 536, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 576, 577, 580, 581, 584, 585, 604, 605, 606, 607, and 537.

All state rooms, with the exception of the 56 single inside rooms, consist of double lower and single upper berths — accommodating two or three people.

8 rooms with shower and toilet

Room numbers: 266, 267, 268, 289, 600, 601, 602, 603.

PARLORS

2 parlors, double beds, special, with toilet

The \$15 price is for these parlors which will accommodate 2 persons, including the \$10 base price is \$17.50. Parlor Numbers 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 242, 243, 246, 247, 250, 251, 254, 255, 270, 271, 272, 273, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 534, 535, 536, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 576, 577, 580, 581, 584, 585, 604, 605, 606, 607, and 537.

2 parlors, twin beds, tub and shower bath

The \$17 price is for these parlors which will accommodate 2 persons, including the \$10 base price is \$18.50. Parlor Numbers 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 242, 243, 246, 247, 250, 251, 254, 255, 270, 271, 272, 273, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 534, 535, 536, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 576, 577, 580, 581, 584, 585, 604, 605, 606, 607, and 537.

12 parlors, twin beds, tub and shower bath, couch

The \$20 price is for these parlors which can accommodate 3 persons on couch). For the two persons which this parlor will normally accommodate per person will be \$20—including the base price of \$10. Parlor Numbers C, D, G, H, I, J, K, L, O, P.

7 parlors, twin beds, tub and shower bath, couch and veranda

The \$25 price is for these parlors which can accommodate 3 persons on couch). For the two persons which this parlor will normally accommodate per person is \$22.50—including the base price of \$10. Parlor Numbers W, X, Y, and Z.

1 parlor, twin beds, tub and shower bath and veranda

ACCOMMODATIONS WILL BE FILLED IN THE ORDER OF THEIR RECEIPT—USE THIS FORM NOW

WILL YOU BE WITH US?

If you are going—and, of course, we assume you are—come with us on this extraordinary trip to the Machine Tool Show in Cleveland, September 12-13. Why not go with A.S.T.E. and your friends on this

low cost, all expense trip via the largest, finest steamer on the lakes? This will be *some* stag party — the boat is ours for the entire round trip.

Reservations Are Coming In — Fast

We are obliged to fill reservations in the order of their receipt. Have you made your reservation yet? It now appears that more than our quota will make this trip—get your reservation in. Act now! Don't delay! If the reservation of your first choice is already taken we will promptly fill it with a similar accommodation as close to the reservation requested as possible.

LET'S ALL GO TOGETHER TO THE MACHINE TOOL SHOW ON THIS GLORIOUS, INEXPENSIVE TRIP

A. S. T. E. has chartered the Steamer Greater Detroit for this event and is able to offer members and their friends in the

industry this all expense trip for the low cost of —

\$10

BASE PRICE

This base price includes the essentials of the trip and is the biggest "money's worth" you ever bought. Use the deck plans and information on opposite page to make up your reservation. Then fill in the form below and mail to Society headquarters. Do this *now*. The time is getting shorter — September 12th is the day we sail.

TEAR OUT THIS FORM AND MAIL NOW!

American Society of Tool Engineers
31 Melbourne
Detroit, Michigan

IMPORTANT

EVERY Ticket holder must be registered by Name, Company and position. List below, or enclose this information with your application.

Dear Sir:

Please reserve Room Number(s) or parlor(s) Number for

..... persons on the A.S.T.E. Cleveland trip, Greater Detroit, September 12-13,

1935. I enclose in the amount of \$
(check, M. O., cash)

Signed

Company

Position

For further

information

call MA2057

Send tickets to me at

City

State

(Continued from page 13)

lathe is running or stopped insures a slow drifting action of the mating members as they engage and harmful clash is impossible.

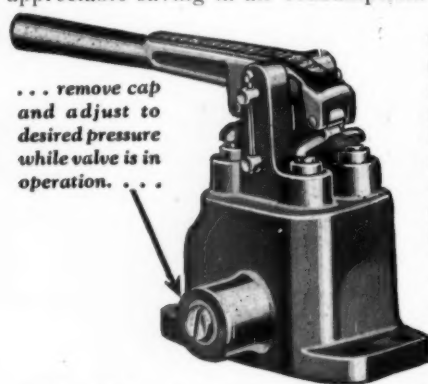
Synchronizing with the operation of the selector valve is a slide rule showing in large legible figures the cutting speed of the work and the effective spindle speed which eliminates the necessity of calculation by the operator or supervisor to obtain this information.

A spindle release handle toward the front of the headstock is provided for work chucking and when operated stops the spindle if left running and leaves it free to be turned by hand. A reverse movement of the handle starts the spindle. If operation of this handle is effected when the brake is engaged the spindle is released and reengaged.

Gears and shafts are mounted on roller or ball bearings and the spindle is furnished with these types of anti friction bearings or hardened spindle and taper adjustable bronze bearings which is provided with a handle for adjustment in front of and below the exterior of the front bearing, giving .0002" diameter adjustment for a full turn of the handle.

Two Pressure Operating Valve

The actual pressure required for the idling stroke of a piston in a cylinder is in most cases much less than that required for the work stroke. The Ross Operating Valve Company is now producing a Two Pressure Operating Valve based upon this principle which provides for full line pressure on the work stroke and selected reduced pressure (easily set or adjusted after the valve is installed) for the return or idling stroke. This difference in pressure is an appreciable saving in air consumption.



The effective savings are not probabilities, but actualities, it is claimed, and can be easily and accurately measured while the valve is in operation.

For further details write the Ross Op-

erating Valve Company, Detroit, Michigan.

Of 8850 tickets issued to traffic violators in Detroit during the past few months, about 48% were for speeding. Yet, this class was responsible for only 1.42% of accidents during that period (which doesn't consider the road hog who quite probably was the real culprit) while weavers and left side drivers, who caused 10% of the accidents, only received 9.2% of the tickets.

If only Mr. W. Maxwell Gray, who spoke so enthusiastically about the future car at an A.S.T.E. meeting, could convince our worthy Police Commissioners that the 90 mile car of today is safer than the 60 mile car of yesterday!!!!!!

TIME STUDIES AND THE MAN

By JOHN YOUNGER, Ohio State University

MANY TIME STUDY PROBLEMS ARE PSYCHOLOGICAL IN NATURE AND SOLUTION. THE SCIENTIFIC ACCURACY OF THE STUDY OF TIME IS IMPORTANT BUT THE STUDY OF THE MAN IS ALSO PART OF THE WORK.

Time study involves the scientific calculation of how long it takes a man to perform some operation. At first glance it would seem to be an easy matter but complications develop the more the thing is analyzed.

In the olden days the time study men would disappear more or less behind a column in the shop, having his stop watch in his pocket. He would peer out furtively at the man he was studying, presumably (the man) being unaware of the study. Presently the shop boy would stroll along and see the performance. He would go up to the man and whisper to him that he was being "clocked." Immediately work would slacken off, the belt would go on the slow pulley, the feed would become the first and the depth of cut a joke. The man would make all possible delays and the poor time study man was there clocking him. Is it any wonder that time study in the early days got into disrepute.

Today we are open and above board in our work of timing the man. We go up to him and we say, "Bill, we're going to time time study you. Possibly you're not getting a square deal on the money for this job and we're here to see that you will get it in the future." Unless Bill is a confirmed grouch he will respond to square deal treatment and we can proceed to analyze his times.

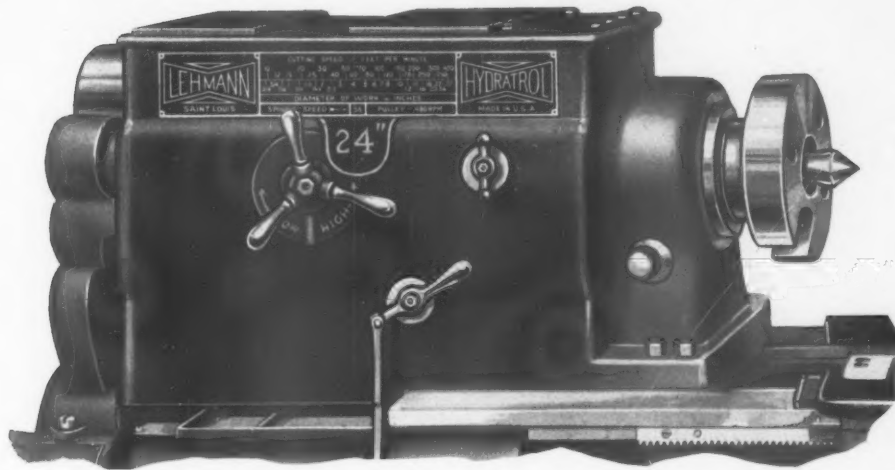
We must stand alongside him because we want to check him, and we must be diplomatic and genial with him, because we want his good will so that he will do as we ask. So we check his speed and feed and depth of cut, and his continuity of performance, and we arrive at a time for his work completely and part. This time is made up somewhat as follows:

- 1.—Setting up the job as a start for all jobs.
- 2.—Setting up the job that must be done each time.
- 3.—Setting up the tools for all jobs.
- 4.—Setting up the tools for each job.
- 5.—Time of operation on the job itself.
- 6.—Time of cleaning up after each job.
- 7.—Time of cleaning up after all jobs.
- 8.—Time out for machine delays.
- 9.—Time out for personal needs.
- 10.—Time out for fatigue.

To some time study experts there are somewhat broad classifications and finer detail is entered on. We will consider this more fully later in discussing Motion Study. But even at that the stop watch is rarely going continuously during (5) the time of operation on the job itself. Mr. Bedaux' organization takes time out if the man pauses to blow his nose or wipe the mist off his glasses or drop a tool or grind a tool. In brief, only the actual time that

HYDRATROL

A Lathe Head With Brains



SELECT YOUR CUTTING SPEED—THE
HYDRATROL

Automatically Changes to the Right Spindle Speed

AUTOMATIC HYDRAULICALLY OPERATED
FRICTION CLUTCHES, POSITIVE CLUTCHES and BRAKES
Controlled From Apron or Headstock



AUTOMATIC SLIDE RULE

Which Gives Spindle Speeds and Cutting Speeds in F. P. M.

TIMKENIZED or TAPER ADJUSTABLE SPINDLE BEARINGS

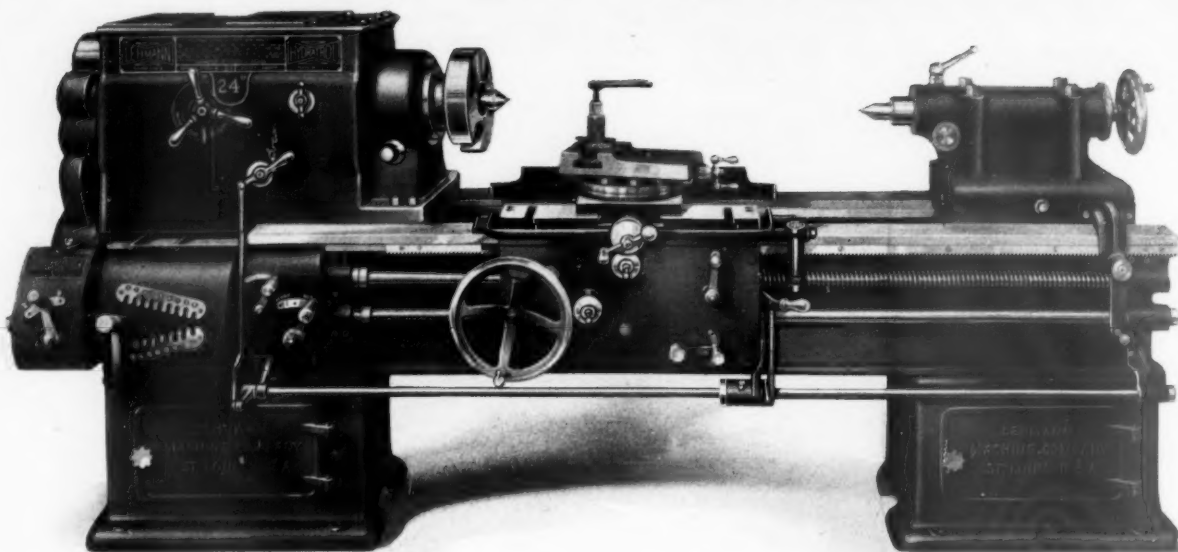
LEHMANN MACHINE COMPANY

SAINT LOUIS, U. S. A.

REPRESENTATIVES:

BAUSCHKE MACHINERY CO.
7338 WOODWARD AVE.
DETROIT, MICH.

LEHMANN HYDRATROL



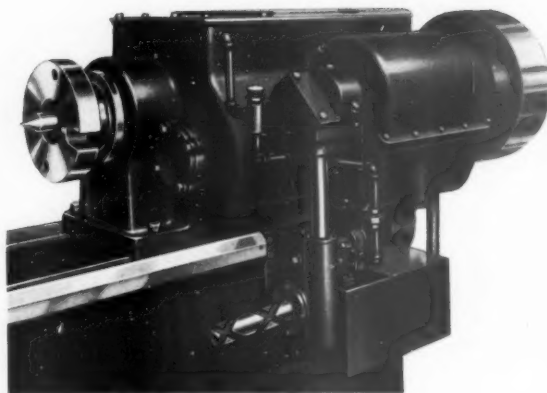
BUILT IN SIZES 16-INCH TO 24-INCH

Spindle Release for Chucking
• • •

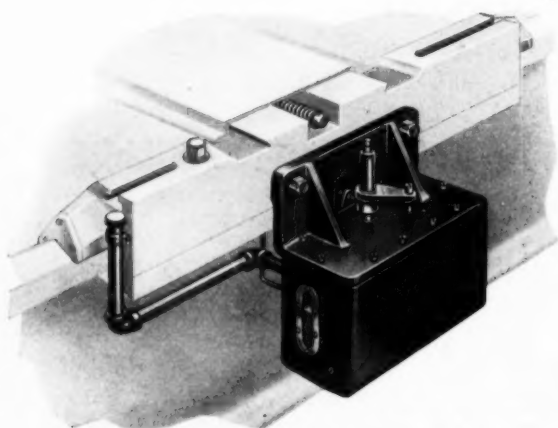
Automatic Safety Relay for Changing Speeds
When Lathe Is Running
• • •

Start, Stop and Reverse From Apron or
Headstock
• • •

Positive Lubrication to All Points in Headstock
Through Pump and Filter



*Pump and Reservoir for Headstock,
Showing Rapid Traverse Connection*



*Pump and Reservoir for Carriage, Cross Slide
and Taper Attachment Lubrication*

Automatic Positive Lubrication to Carriage,
Cross Slide and Taper Attachment
• • •

ALSO

Other Well Known Improvements Developed in
the Past 20 Years

BY

LEHMANN MACHINE CO.

SAINT LOUIS, U. S. A.

→ SEND FOR DESCRIPTIVE LITERATURE ←

(Continued from page 10)

500 Technical Experts in the booths ready to answer questions.

1,000 Assistants to demonstrate operations.

25,000 Persons will see the Show!

Executives and Engineers of more than 12,000 companies using machine tools—Executives of Railroads—Government Officials—Consulting Engineers—Bankers—Writers—will arrive in Cleveland to see the Show.

They will come from every state in the Union, from every important city and town; from Canada, Mexico, Europe and Asia.

Applications already are pouring in to Cleveland hotels under the direction of Cleveland's

Hotel Bureau located at 1604 Terminal Tower Building.

A MACHINE TOOL CONGRESS coincident with the show—

After Show hours the Engineering Societies provide a forum for discussion of technical subjects relating to design, construction and use of machine tools. Their meetings are under direction of—

American Society of Mechanical Engineers

American Society of Tool Engineers

Society of Automotive Engineers

Cleveland Engineering Society

Reduced railroad fares are issued to the Congress.

MY PAL

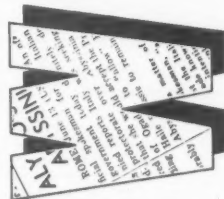
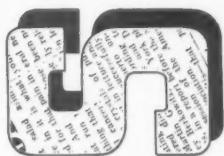
Speaking of old timers, I recall a friend whom I once helped to design an automatic machine for making cigarettes. Duly grateful (my services were gratis, by the way) Ol' Pal insisted on rewarding me—in his own way. "Andy," he vowed, "so long as you're in Noo Yawk, you'll never need to buy no cigarettes."

And sure enough, my landlady handed me a huge package a few weeks later, with the comment: "Your friend, Mr. Kopfsmerz, left this with his compliments."

It was full of cigarettes—thousands of 'em! Lit one. Hmm m. . . Gosh! Mebbe there is some truth in what some folks say cigarettes are made of. Tried another; 'twas worse'n the other. And so on. Fella from the next room came in (he was always bumming smokes) so I told him to help himself. He quit smoking. Those of my friends whose affections were not alienated always bought their own after that.

"Well, Andy, how was they?" enquired the donor, dropping in one night. "Why, what is . . . ?" in response to my look. Delving into the box, he began breaking the cigarettes. "Oh my my! These was experimental cigarettes, what we made by macerating the old ones and putting 'em through again. Right from the floor we swept 'em. But I'll send you another box. I tell you, Andy, so long as you're in Noo Yawk. . . ."

But I left New York shortly after that.



●
**SEE THE
LANDIS
EXHIBIT**

●
**BOOTHS
J & K
IN THE
ARCADE**

LANDIS WILL EXHIBIT 10 MACHINES IN ACTION . .

Yes, sir! When you attend the Machine Tool Show you will see ten cost reducing, product improving grinders in action at the Landis booths. All of them are recent developments. Several have not been shown or even announced before.

The following machines will be included in the exhibit:

- 5"x40" Hydraulic Cam Grinder
- 10"x36" Type C Semi-Automatic Hydraulic Grinder
- 16"x42" Type D Hydraulic Crank Pin Grinder
- 3½" Hydraulic Internal Race Grinder
- 5" Hydraulic External Race Grinder
- 6"x18" Type C Plain Hydraulic Grinder
- 14"x48" Type D Plain Hydraulic Grinder
- 15"x8" Type C Hydraulic Internal Grinder
- 14"x36" Type C Hydraulic Universal Grinder
- 12"x32" Tool and Cutter Grinder

After you have seen this array of Landis grinders you will be convinced that there is ample opportunity for the reduction of costs and improving of quality in your grinding department. By all means attend the Show and, while there, don't miss the Landis exhibit.

202

Landis Tool Co.
Waynesboro, Pa.

THIS MONTH'S COVER

GLENCO COMPENSATING TOOL HOLDER

The J. C. Glenzer Company, Detroit, Michigan has added to their line of utility tools a compensating tool holder which automatically compensates for machine spindle mis-alignment thereby producing true and accurately tapped and reamed holes.

Much time is wasted and plenty of scrap is made trying to produce accurately tapped or reamed holes with spindles of machines out of alignment with the work. This requires altering of taps and reamers to overcome machine conditions by the cut and try method.

The Glenco compensating tool holders, it is claimed, will solve these problems with standard taps and reamers by eliminating large and bell-mouthed holes which go into the scrap heap.

Five standard stock sizes of holders are made with capacities up to 5 inch tool diameters, in types to fit hand and automatic screw machines, Garvin tappers, adjustable multiple spindles, and all drilling and tapping machines of all types. Special or larger holders than standard can be made up promptly and engineering department of the company will be glad to assist in solving special problems.

Since all parts are hardened and ground, wear is negligible, therefore, repair or service units will fit correctly in holders which have seen extended service. Any stock size will be sent on a 30 day trial for inspection and test.

Parts of the Glenco Compensating Tool Holder

1—SHANK;

Material, chrome nickle steel accurately machined, hardened and ground. Can be furnished in Morse or other tapers, regular straight, close coupled straight, threaded adjustable adapter, straight hole or tapered hole as generally used on Garvin tappers.

2—COMPENSATORS;

Material, chrome vanadium steel, drop forged, accurately machined, heat treated to rigid inspection. Driving lugs are machined integral with body and of sufficient size and strength to withstand shocks.

3—BUSHINGS;

Material, chrome vanadium steel, heat treated and ground. Purpose, to reduce friction during compensating movements when sliding in slots provided in shank and float sleeve, also provide an economical replacement for wear.

4—ROLLERS;

Material, tool steel, hardened and ground, are used to separate compensator sides from end of shank and flange of float sleeve and can be used on end or on diameter, or balls may be substituted for light work.

5—FLOAT SLEEVE;

Material, chrome nickle steel, hardened and ground, carries the tool which is the part that actually moves off center when misalignment exists. Standard holders are carried in stock with Morse taper holes, however, specials with straight holes for straight shank tools and specials with arbors for reamers with holes either straight or taper, can be supplied to interchange with other standard parts of holder.

6—BALL RACE;

Special of brass and steel balls staggered to distribute contact and eliminate friction allowing holder to float freely.

7—THRUST PLATE;

Material, 52100 bearing steel, hardened and ground on two sides, made reversible for extra life and adjustment.

8—CAP;

Material, chrome nickle steel, heat-treated, face and inside shoulder ground to accommodate the assembly length of parts and is screwed to shank to hold assembly together.

9—CHIP PROTECTOR;

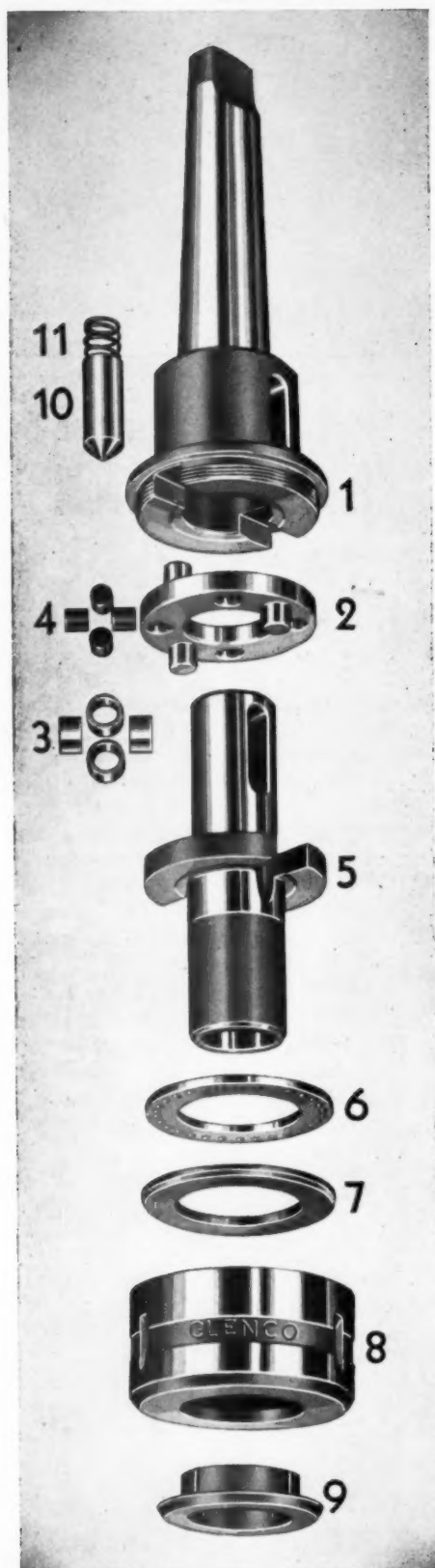
Material cold drawn steel, hardened and split to slip over extended end of float sleeve and inside open end of cap to exclude dirt and chips from moving parts within.

10—CENTRALIZING PLUNGER;

Material, tool steel hardened and ground, operates against float sleeve and with spring pressure returns the float sleeve to a central position upon completion of operation. Adjustment affords variable resistance to movement off center.

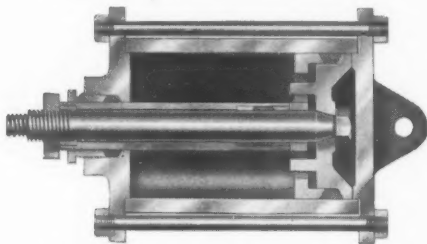
11—PLUNGER SPRING;

Material, spring steel, operates centralizing plunger and can be removed if centralizer is not wanted, or altered to vary centralizing tension.



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EXCLUSIVE DESIGN makes these Air Cylinders "Leak Proof"



★ Greater speed and increased power—and easy maintenance of these features by a simple outside adjustment—result from the improved Hannifin "Leak Proof" cylinder construction.

★ An adjustable piston with soft graphite treated packing replaces the ordinary short-lived and costly cup leather. The packing is adjustable from outside the cylinder by turning the adjusting nut, without removing any part of the cylinder, thus maintaining 100% operating efficiency during entire life of the packing.

★ Friction is greatly reduced and permanently tight, leak-proof performance assured. Lubrication and lubrication fittings are not needed.

★ Hannifin double acting air cylinders for pressures up to 150lbs./sq.in., (or hydraulic service to 200 lbs./sq.in.) are available in eight standard types, in six standard sizes from 3 inch to 12 inch diameter, and for any length stroke required. Both double acting and single acting types are offered; also with cushion at either or both ends of the stroke.

★ Hannifin "Pack-Less" Air Control Valves provide positive control of air cylinders. Standard and special types for all purposes, hand or foot operated, electrical, remote control, duplex, and manifold designs.

Write for Bulletin 34.

★ Hannifin Improved Hydraulic Cylinders for high pressure service up to 1500 lbs./sq.in., are stronger, simpler in construction—no tie rods—and adapted to the widest range of uses. Ask for Bulletin 35.

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PUNCH CLAMP

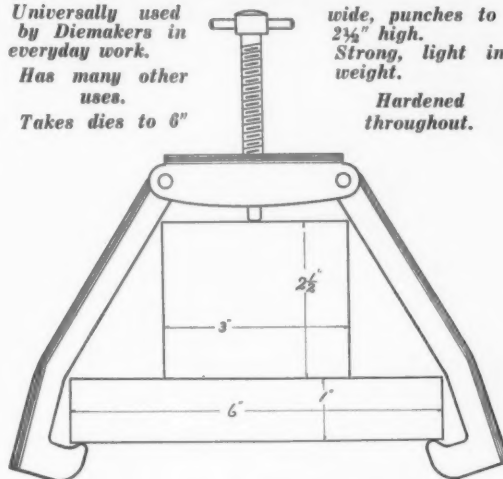
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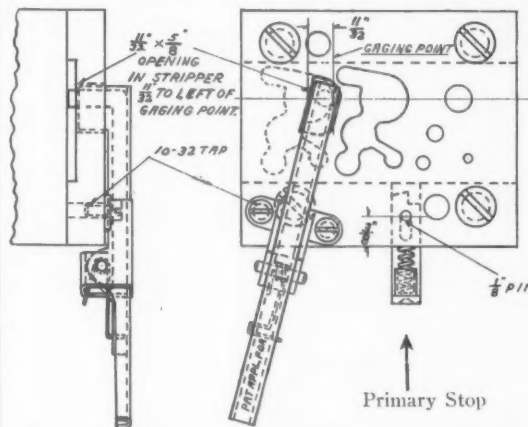
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2½" high.
Strong, light in
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(Continued from page 16)

counts toward the completion of the job is taken, all else is discarded or counted in on personal needs.

These times are not added together to form the time of the cycle. Number 1, 3, and 7 are distributed times over the cycles. Number 1 introduces a human aspect. In some advanced mass production shops this time does not enter the cycle at all, because the operator does not even set up his own machine. A new job, that of machine setter, has been created.

The operator is considered just of sufficient intelligence and no more to be able to start and stop the machine and feed it material. He is not supposed to know anything about the cams or the stops or the arrangement of tools that one gets on our modern tools. The setting of such a machine as a Ballard Multimatic Boring machine, or a Gisholt six-spindle automatic lathe calls for a very highly intelligent type of workman who is rarely on piece work.

Personal needs are taken as a general rule at three per cent of the total time spent on each phase of the cycle. It includes the usual needs of man, such as taking a drink from the fountain, washing one's hands and so forth. We have never seen any research made on the subject but three per cent is a fair figure.

Losses due to fatigue are well nigh impossible to determine, and vary tremendously from a few per cent to two or three hundred per cent.

The work on an automatic machine making small diameter products has only light bars of steel to place in the machine, and he has a sufficient in-

terval of time between each placement to get a rest if he really needs one.

On the other hand the operator lifting heavy castings from the floor to be chucked in a lathe may require several minutes for fatigue rest. In steel mills, with the high temperatures and the heavy effort required, many gangs are doubled, one gang or one man resting while his alternate is working. Monotony of work is often a source of fatigue, particularly mental fatigue.

Sometimes chairs or stools are wrongly designed. A tall draftsman sitting on a short stool is liable to become fatigued, just as readily as his shorter neighbor sitting on a high stool. Some stools should have backs to them so that rest may be obtained by leaning back.

We have always advocated the use of clear glass windows in a drafting room. The men can lift their eyes from the board and look at far distant objects or at the clouds in the sky and so obtain a measure of relief from eyestrain. We intend to discuss this subject more fully in a later chapter.

*Professor Arthur G. Anderson of Illinois has stated or rather suggested the following allowance for fatigue in industry:

NATURE OF WORK

Tasks requiring mild effort and little skill	5-10 per cent
Tasks requiring medium skill and close attention but not hard physical work	10-20 " "
Tasks calling for reasonably hard work	15-30 " "

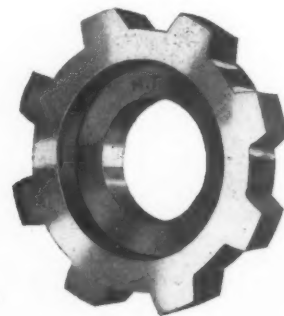
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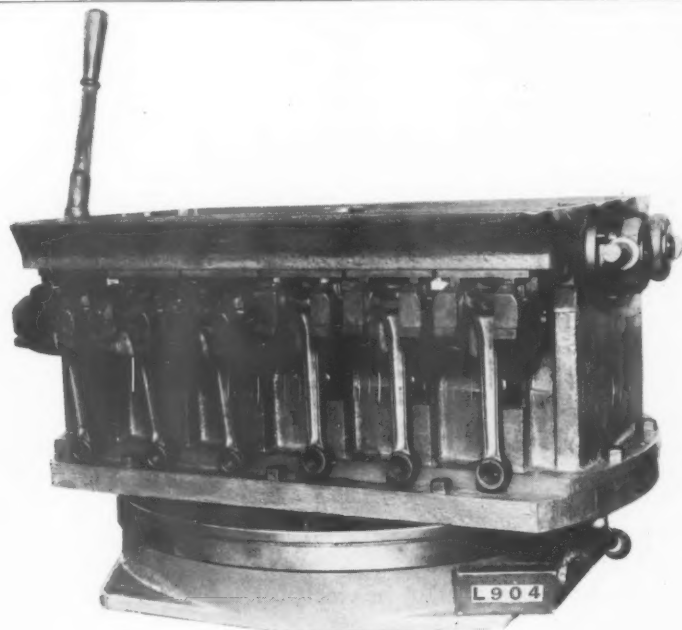
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FOR AUGUST, 1935

23

(Continued from page 22)

Tasks requiring skill and hard work	20-33	"	"
Tasks performed under adverse physical conditions	30-40	"	"

Fatigue can only be measured by the experienced time study operator making an intensive study of the matter.

If fatigue rests are not allowed errors will creep into the work and production will suffer. Men working overtime or on night shifts are particularly subject to fatigue due to lack of proper sleep, and hence their work is found more liable to errors than that of the normal day shift.

Time studies are used for many purposes but the one that concerns us mostly here is that of wage setting. After the time of the cycle has been obtained by adding up the particular local operations and distributing the general ones then the time is converted into the money the operator should receive. Incidentally, the time should be the time for best effort and continuous work, so the money is the base rate plus the allowance for extra energy. An example will make this more evident.

Suppose the lot size of a product is 100 pieces	
Suppose the time taken to set up	
job generally is	2 hours
Suppose time taken is set up job	
locally is	15 minutes

*See "Industrial Engineering and Factory Management," by Arthur G. Anderson, Ronald Press Company."

Suppose the time taken to set up	
tools locally is	5 minutes
Suppose time of operator is	30 minutes
Suppose time of local clean up is	5 minutes
Suppose time of final clean up is	15 minutes

The time of breakdown of machine is observed as 15 minutes every 50 hours or 5 per cent. Suppose the men rests for fatigue 110 minutes every 2 hours or say $8\frac{1}{2}$ per cent. Personal needs are taken as three per cent. Finally, suppose the base rate is 50 cents an hour and you expect the man to make 70 cents an hour under piece rate conditions such as are represented by the time taken.

Then—

Local operations add up to $15+5+30+5$ or 55 minutes

Distributed operations are 135 minutes for 100 pieces or 1.35 minutes per piece.

Machine breakdowns are taken as 0.5 per cent of 55 minutes or .27 minutes.

Fatigue is taken as $8\frac{1}{2}$ per cent on the $55+1.35$ minutes or 4.8 minutes added to the cycle.

We now have time of cycle equal to $55+1.35+4.8$ minutes or 61.15 minutes.

Personal needs add 3 per cent or 1.83 minutes.

Thus giving us the actual time of the cycle as 62.98 or 63 minutes.

Piece work price per piece is $(63/60 \times 70)$ cents or 73 cents.

The question may be asked at this point why when we are dealing with such a variable as man is do we reckon our times down to $1/5$ of a second



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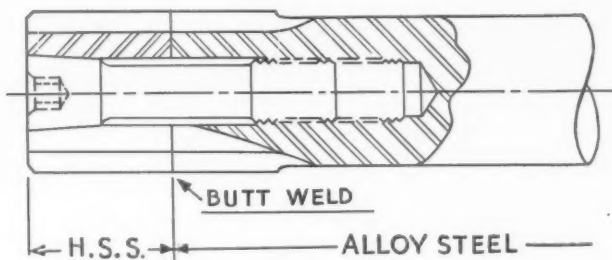
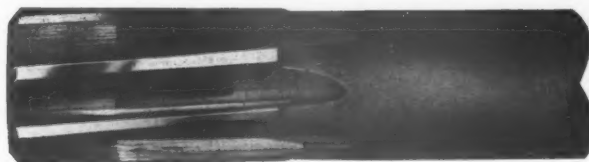
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(Continued from page 24)

or 0.01 of a minute according to the type of watch used. Let us translate 0.01 of a minute into money, and assume the man gets 6.00 a day of 8 hours or 75 cents an hour.

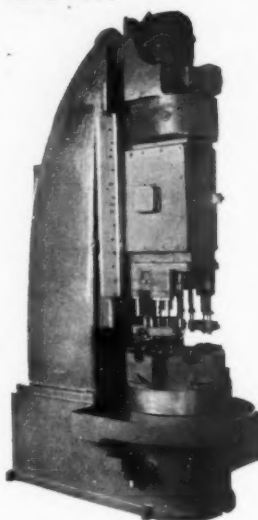
This in turn equals 1.25 cents a minute or .0125 cent per 0.01 minute. This is only the labor charge and if we add an overhead of say 200 per cent we raise this to a value of .038 cent gross total. Assuming a production of 10,000 pieces per day such as one may get in many of our mass production shops and assume 300 days a year, we get a total of .038 x 10,000 cents or \$1140.

We can put this working out in a perhaps more fascinating way which will serve to emphasize the fact that it is the little portions of a minute that count.

The writer firmly believes that savings in a mass production product can be made most thoroughly and intelligently to a study of little things.

Consider an automobile whose factory cost is around \$350. There are 10,000 individual pieces in that particular car and in making these pieces there is an average of 5 operations per piece or a total of 50,000 operations. If 0.01 minute is saved on each operation or a total of 0.38 cents per operation then we have a total of 190 saved or well over the half the cost of the car.

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Complete drilling and tapping machine built up of Buhr Universal Power Unit welded steel Base and column, index table and holding jig.

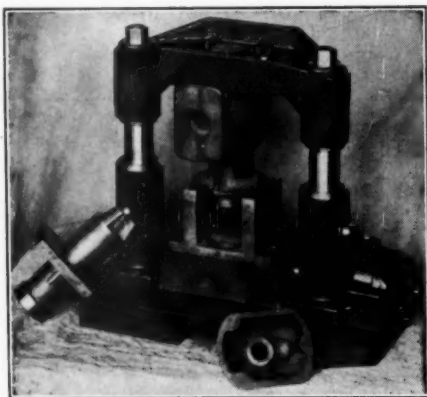
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